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they would be observed from a prescribed visual point], the virtual generation apparatus comprising:

shape data memory [means for storing] which stores shape data [pertaining to physical] defining shapes of the terrain objects present in said virtual space;

position [data] specification means [for specifying data for said subjects] which specifies position of the operator-controlled object with respect to the terrain objects;

overlap determination means [for determining] which determines, on the basis of said shape data [stored in said shape data memory means] and said position data [for said subjects specified by said position data specification means], whether or not [said physical] a terrain object is located between said [visual point] viewpoint and said [subject] operator-controlled object [should overlap and be visible from said visual point]; and

image generation means [for generating virtual images] which generates image data for displaying on a monitor screen the operator-controlled object and the terrain objects viewed from the viewpoint, wherein [said physical] a terrain object is processed [by prescribed] so as to be displayed as a show-through [processing] image through which the operator-controlled object can be viewed in the event that said overlap determination means [has determined] determines that said [subject and said physical] operator-controlled object [are disposed in a prescribed overlapping state] is intervened by the terrain object when viewed from the current viewpoint, and [for generating virtual

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images] wherein [said physical] the terrain object is processed [by non-show-through processing and is not] so as to be rendered as a non- show-through image in the event that both of said [subject] operator-controlled object and [said physical] the terrain object are [disposed in a state other than] viewed without a prescribed overlapping state from the current viewpoint.

3. (Amended) A virtual image generation apparatus [as defined in Claim 2,] which generates images observed from a viewpoint to be displayed on a monitor, said images including an operator-controlled object moving relative to virtual terrain objects, said operator-controlled object and said terrain objects being defined within a three-dimensional virtual space, comprising:

shape data memory which stores shape data defining shapes of said terrain objects present in said virtual space;

position specification means which specifies position of said operator-controlled object with respect to said terrain objects;

overlap determination means which determines, on the basis of said shape data and said position data, whether or not a terrain object is located between said viewpoint and said operator-controlled object; and

image generation means which generates image data for displaying on said monitor said operator-controlled object and said terrain objects viewed from said

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viewpoint, wherein a terrain object is processed so as to be displayed as a show-through image through which the operator-controlled object can be viewed in the event that said overlap determination means determines that said operator-controlled object is intervened by the terrain object when viewed from the current viewpoint.

wherein said overlap determination means computes a first vector which extends in a direction in which said [subject] operator-controlled object is observed from said [visual point] viewpoint and a second vector which extends from said [physical] terrain object towards said [subject] operator-controlled object, computes the angle formed by [this] the obtained first vector and second vector, and, in the event that this angle falls within a prescribed relationship with regard to a prescribed reference angle, [decides] determines that [an overlapping state exists, or, in the event that this angle falls outside the prescribed relationship, decides that a non-overlapping state exists] the operator-controlled object is intervened by the terrain object when viewed from the current viewpoint.

4. (Amended) A virtual image generation apparatus as defined in Claim 2, wherein said overlap determination means compares a displacement from a prescribed ground point for a first reference point [previously] specified for said [subject] operator-controlled object with a displacement from a ground point for a second reference point [previously] specified for said [physical] terrain object, and, in the event that the

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displacement for said first reference point is smaller than the displacement for said second reference point, decides that [an overlapping state exists, or, in the event that the displacement for said first reference point is greater than the displacement for said second reference point decides that a non-overlapping state exists] the operator-controlled object is intervened by the terrain object when viewed from the current viewpoint.

5. <sup>Term 3</sup> (Amended) A virtual image generation apparatus as defined in Claim [2] 3, wherein said overlap determination means makes a determination that [said overlapping state exists] the operator-controlled object is intervened by the terrain object when viewed from the current viewpoint in the event that the angle [defined in Claim 3 has] falls within the prescribed relationship with regard to said reference angle[, and] as well as in the event that a displacement of the operator-controlled object [for the first reference point as defined in Claim 4] is smaller than [the] a displacement of the terrain object, [for the second reference point] wherein said displacement of the operator-controlled object is the displacement from a prescribed ground point for a first reference point specified for said operator-controlled object and said displacement of the terrain object is the displacement from a ground point for a second reference point specified for the terrain object.

6. (Amended) A virtual image generation apparatus as defined in Claim 2, wherein, [for] said show-through [display, said image generation means generates a virtual] image of the terrain object overlapping the operator-controlled object is generated by alternately displaying pixels [for displaying said subject in accordance with a] indicative of the terrain object and pixels indicative of the operator-controlled object in a prescribed pattern[, rather than pixels for displaying said physical object].

7. (Amended) A virtual image generation apparatus as defined in Claim 6, wherein said pattern is a mesh form with [comprises] an alternating sequence of pixels for displaying said [physical] terrain object and pixels for displaying said [subject] operator-controlled object.

8. (Amended) A virtual image generation method which generates images observed from a viewpoint to be displayed on a monitor, said images including an operator-controlled object moving relative to virtual terrain objects, said operator-controlled object and said terrain objects being defined within a [virtually defined] three-dimensional virtual space [virtual images of subjects present in said virtual space as they would observed from a prescribed visual point], said method comprising the steps of:

storing shape data defining shapes of said terrain objects;

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computing the position of the operator-controlled object with respect to said terrain objects;

determining, on the basis of the shape data [relating to objects present in said virtual space] and the position data for said [subjects] operator-controlled object, whether [said physical object] a terrain object is located between [said visual point] the viewpoint and said [subject] operator-controlled object [overlaps] in an overlapping state when viewed from [said visual point] the viewpoint; and

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[, in the event that it is determined that said subject and said physical object are disposed in a prescribed overlapping state,] generating [a virtual] image data for displaying on the monitor the operator-controlled object and the terrain objects viewed from the viewpoint in which [said physical] a terrain object in an overlapping state is processed [by] so as to be rendered as a show-through [processing or,] image through which the operator-controlled object can be viewed in the event that the terrain object is located between the viewpoint and said operator-controlled object in an overlapping state when viewed from the viewpoint, and in which a terrain object [in the event that said subject and said physical object are] disposed in a state other than [a prescribed] said overlapping state], generating a virtual image through non-show-through processing, in which said physical object] is [not] rendered as a non-show-through image.

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9. (Amended) [A recording] An information storing medium for use with a virtual image generation apparatus [for recording program data for generating] which generates images observed from a viewpoint to be displayed on a monitor, said images including an operator-controlled object moving relative to virtual terrain objects, said operator-controlled object and said terrain objects being defined within a [virtually defined] three dimensional virtual space [virtual images of figures present in said virtual space as they would observed from a prescribed visual point, wherein said program data is for the process of], said information storing medium storing a program which executes the steps of:

supplying shape data defining shapes of objects to be displayed;

computing position of the operator-controlled object with respect to the terrain objects;

determining, on the basis of shape data relating to [physical] the terrain objects present in said virtual space and the position data for said [subjects] operator-controlled object, whether [said physical object] any of the terrain objects is located between [said visual point] the viewpoint and said [subject] operator-controlled object [overlaps] in an overlapping state when viewed from [said visual point] the viewpoint; and

[, in the event that it is determined that said subject and said physical object are disposed in a prescribed overlapping state,] generating [a virtual] image data for displaying on the monitor the operator-controlled object and the terrain objects viewed

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*E4*  
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from the viewpoint in which [said physical] any terrain object in an overlapping state is processed [by] so as to be rendered as a show-through [processing or,] image through which the operator-controlled object can be viewed in the event that the terrain object is located between the current viewpoint and said operator-controlled object in an overlapping state when viewed from the current viewpoint, and in which any of the terrain objects [in the event that said subject and said physical object are] disposed in a state other than [a prescribed] said overlapping state [, generating a virtual image through non-show-through processing, in which said physical object] is [not] rendered as a non-show-through image.

*Sub E3*

*E5*

13. (Amended) A game device [virtual image generation apparatus] which generates images observed from a viewpoint to be displayed on a monitor, said images including a player-controlled object moving relative to virtual terrain objects, said player-controlled object and said terrain objects being defined within a [virtually defined] three-dimensional virtual space[, virtual images of subjects present in said virtual space as they would observed from a prescribed visual point], said game device comprising:

an input means with which a game player operates a computer game;

shape data memory [for storing] which stores shape data [pertaining to] defining shapes of objects present in said virtual space;

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position data specifier [for specifying] which specifies current position [data] for  
[said subjects] the player-controlled object with respect to the terrain objects;

overlap determiner [for determining] which determines, on the basis of said  
shape data [stored in said shape data memory] and said position data [for said subjects  
specified by said position data specifier], whether or not [an object] a terrain object is  
located between [said visual point] the viewpoint and [said subject] the player-controlled  
object [should overlap and be visible from said visual point]; and

image generator [for generating virtual images] which generates image data for  
displaying on the monitor the player-controlled object and the terrain objects viewed  
from the viewpoint wherein [said] a terrain object is processed [by prescribed] so as to  
be rendered as a show-through [processing] image through which the player-controlled  
object is viewed in the event that said overlap determiner determines that said [subject  
and said object are disposed] player-controlled object is intervened by the terrain object  
in [a prescribed] an [overlapping] overlap state when viewed from the viewpoint, and  
[for generating visual images] wherein [said] a terrain object is [processed by non-show-  
through processing and is not] rendered without such show-through image effect in the  
event that said [subject] player-controlled object and said terrain object are disposed in  
a state other than [a prescribed] the overlapping state.

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14. (Amended) A [virtual image generation apparatus] game device [as defined in claim 13] which generates images observed from a viewpoint to be displayed on a monitor, said images including a player-controlled object moving relative to virtual terrain objects, said player-controlled object and terrain objects being defined within a three-dimensional virtual space, comprising:

an input means with which a game player operates a computer game;

shape data memory which stores shape data defining shapes of objects present in said virtual space;

position data specifier which specifies current position for the player-controlled object with respect to the terrain objects;

overlap determiner which determines, on the basis of said shape data and said position data, whether or not a terrain object is located between the viewpoint and the player-controlled object; and

image generator which generates image data for displaying on the monitor the player-controlled object and the terrain objects viewed from the viewpoint, wherein a terrain object is processed so as to be rendered as a show-through image through which the player-controlled object is viewed in the event that said overlap determiner determines that said player-controlled object is intervened by the terrain object in an overlap state when viewed from the viewpoint.

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wherein said overlap determiner[:] computes a first vector that extends in a direction in which said [subject] player-controlled object is observed from said [visual point] viewpoint, and a second vector that extends from said terrain object towards said [subject] player-controlled object, computes an angle formed by said first vector and said second vector, and determines whether or not said player-controlled object is intervened by the terrain object when viewed from the viewpoint in an overlap state [exists] in accordance with whether said angle falls within a prescribed relationship with a reference angle.

15. (Amended) A [virtual image generation apparatus] game device as defined by claim 13, wherein said overlap determiner:

compares a displacement from a ground point for a first reference point for said [subject] player-controlled object with a displacement from said ground point for a second reference point for said terrain object, and

determines whether or not an overlap state, in which the player-controlled object is intervened by the terrain object when viewed from the viewpoint, exists in accordance with whether said displacement for said first reference point is smaller than said displacement for said second reference point.

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16. (Amended) A [virtual image generation apparatus] game device as defined by claim [13] 14, wherein said overlap determiner:

[computes a first vector that extends in a direction in which said subject is observed from said visual point, and a second vector that extends from said object towards said subject, computes an angle formed by said first vector and said second vector, and]

compares a displacement from a ground point for a first reference point for said subject with a displacement from said ground point for a second reference point for said object, and

*ES*  
*cont.*  
determines whether or not an overlap state, in which the player-controlled object is intervened by the terrain object when viewed from the viewpoint, exists in accordance with whether said angle falls within a prescribed relationship with a reference angle and said displacement for said first reference point is smaller than said displacement for said second reference point.

17. (Amended) A [virtual image generation apparatus is] game device as defined by claim 13, wherein said show-through [processing generates virtual images] image for the terrain object overlapping the player-controlled object is generated by alternately displaying pixels indicative of the terrain object and pixels indicative of the player-

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controlled object in [accordance with] a prescribed pattern [rather than pixels for displaying said object].

18. (Amended) A [virtual image generation apparatus] game device as defined by claim 17, wherein said pattern [comprises] is a mesh form with an alternating sequence of pixels for displaying said terrain object and pixels for displaying said [subject] player-controlled object.

<sup>3</sup>  
~~19~~. A virtual image generation apparatus as defined in claim <sup>1</sup>~~2~~, wherein said terrain objects include one or more of an explosion, an enemy robot, an obstacle background, a building and topographical features.

<sup>9</sup>  
~~20~~. A virtual image generation method as defined in claim 8, wherein said terrain objects include one or more of an explosion, an enemy robot, an obstacle background, a building and topographical features.

<sup>11</sup>  
~~21~~. An information storing method as defined in Claim <sup>10</sup>~~9~~, wherein said terrain objects include one or more of an explosion, an enemy robot, an obstacle background, a building and topographical features.

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<sup>14</sup>  
~~22~~. A game device as defined in Claim <sup>12</sup>~~13~~, wherein said terrain objects include one or more of an explosion, an enemy robot, an obstacle background, a building and topographical features defined in the three-dimensional virtual space.

<sup>4</sup>  
~~23~~. A virtual image generation apparatus as defined in Claim <sup>1</sup>~~2~~, wherein said show-through image for the terrain object overlapping the operator-controlled object is rendered translucent.

<sup>15</sup>  
~~24~~. A game device as defined in Claim <sup>12</sup>~~13~~, wherein said show-through image is rendered translucent.

<sup>86</sup>  
<sup>cont.</sup>  
~~Sub Figure~~  
25. A computer system comprising a graphic image processor wherein various objects are defined in a three-dimensional virtual space and programs are executed in response to an operator's instruction so that a operator-controlled object moves against a terrain composed of terrain objects defined in the three-dimensional virtual space and images of the operator controlled object and the terrain objects viewed from a viewpoint are generated for displaying on a monitor, the computer system comprising:

an input means which is manually controlled by an operator, the image of said operator-controlled object moves in response to the operator's control with the input means;

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shape data memory stored with shape data for objects; and  
processing means for rendering images of the operator-controlled object and the terrain objects for displaying on the monitor,  
wherein the processing means determines positions of the operator-controlled object with respect to the terrain objects and, in the event that a terrain object is located intervening the operator-controlled object in the three-dimensional virtual space when viewed from the viewpoint, renders a portion of the terrain object overlapping with the operator-controlled object with a show-through image effect.

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cont. 19  
26. The computer system of claim 18, wherein said show-through image effect is rendered by processing said overlapping portion with a translucent effect.

27. The computer system of claim 25, wherein said show-through image effect is rendered by processing said overlapping portion with alternately rendering pixels for the terrain object and pixels for the operator-controlled object in a meshed pattern.

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28. A computer system defining various objects in a three-dimensional virtual space and executing programs that respond to an operator's instruction so that an operator-controlled object moves against a terrain composed of various terrain objects defined in

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the three-dimensional virtual space and images of such objects viewed from a viewpoint are generated for displaying on a monitor, comprising:

an input means manually controlled by an operator, the image of said operator-controlled object moving in response to the operator's control with the input means; and

processing means which generates images of the operator-controlled object and the terrain objects for displaying on a monitor,

wherein said processing means determines positions of the operator-controlled object with respect to the terrain objects and, in the event that a terrain object is located intervening the operator-controlled object in the three-dimensional virtual space when viewed from the viewpoint, renders a portion of the terrain object overlapping with the operator controlled object with a show-through image effect.

29. A method of rendering images on a computer system, the computer system defining objects in a three-dimensional virtual space, said objects including an operator-controlled object and a terrain composed of terrain objects, and wherein said computer system renders images of said objects viewed from a viewpoint for displaying on a monitor, said method comprising the steps of:

receiving signals from an input means controlled by an operator;

processing the signals so that the operator-controlled object moves relative to the terrain objects in response to said signals;

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determining positions of the operator-controlled object with respect to the terrain;  
rendering images of the operator-controlled object and the terrain objects viewed  
from the viewpoint for displaying on the monitor,

wherein, in the event that a terrain object is located intervening the operator-  
controlled object in the three-dimensional virtual space when viewed from the viewpoint,  
a portion of the terrain object overlapping with the operator-controlled object is rendered  
with a show-through image effect.

30. An information storing medium for use with a computer system defining objects in a  
three-dimensional virtual space said objects including an operator-controlled object a  
terrain composed of terrain objects, wherein said computer system renders images of  
said objects viewed from a viewpoint for displaying on a monitor, said medium storing a  
program which executes the steps of:

receiving signals from an input means controlled by an operator;

processing the signals so that the operator-controlled object moves relative to  
the terrain objects in response to said signals;

determining positions of the operator-controlled object with respect to the terrain  
objects;

rendering images of the operator-controlled object and the terrain objects viewed  
from the viewpoint for displaying on the monitor,

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